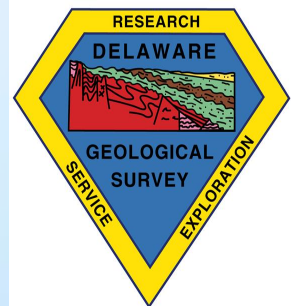
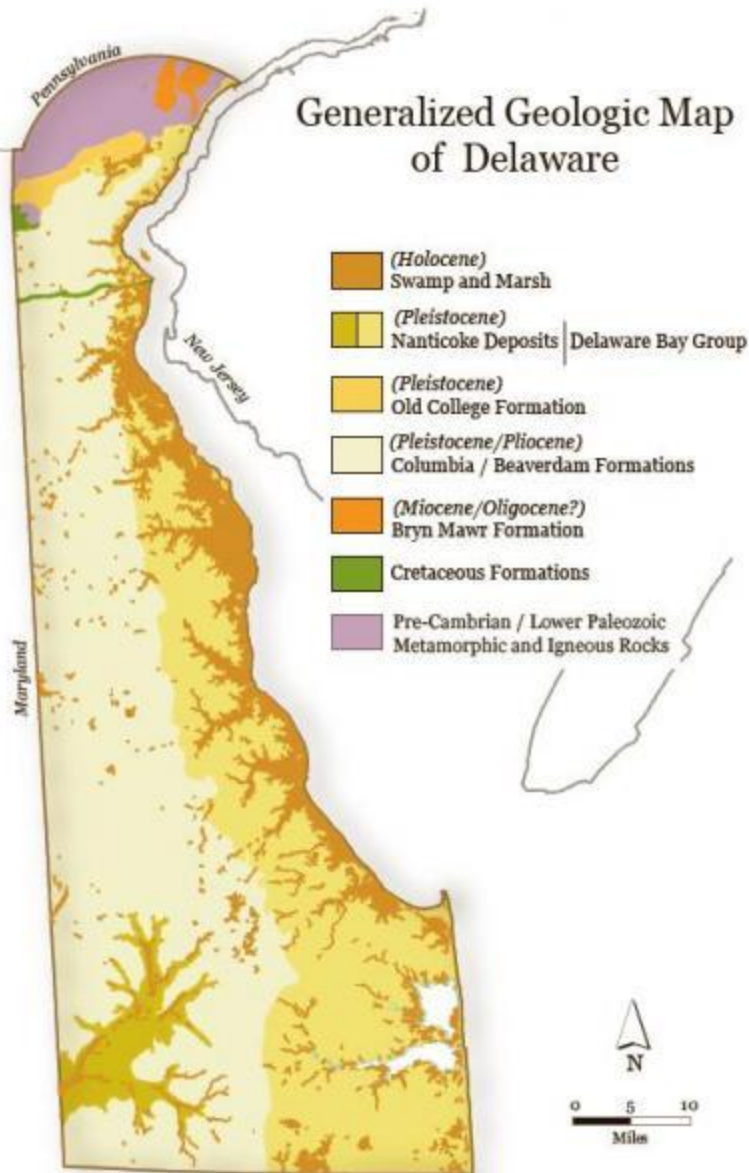


Delaware Geological Survey Groundwater Monitoring

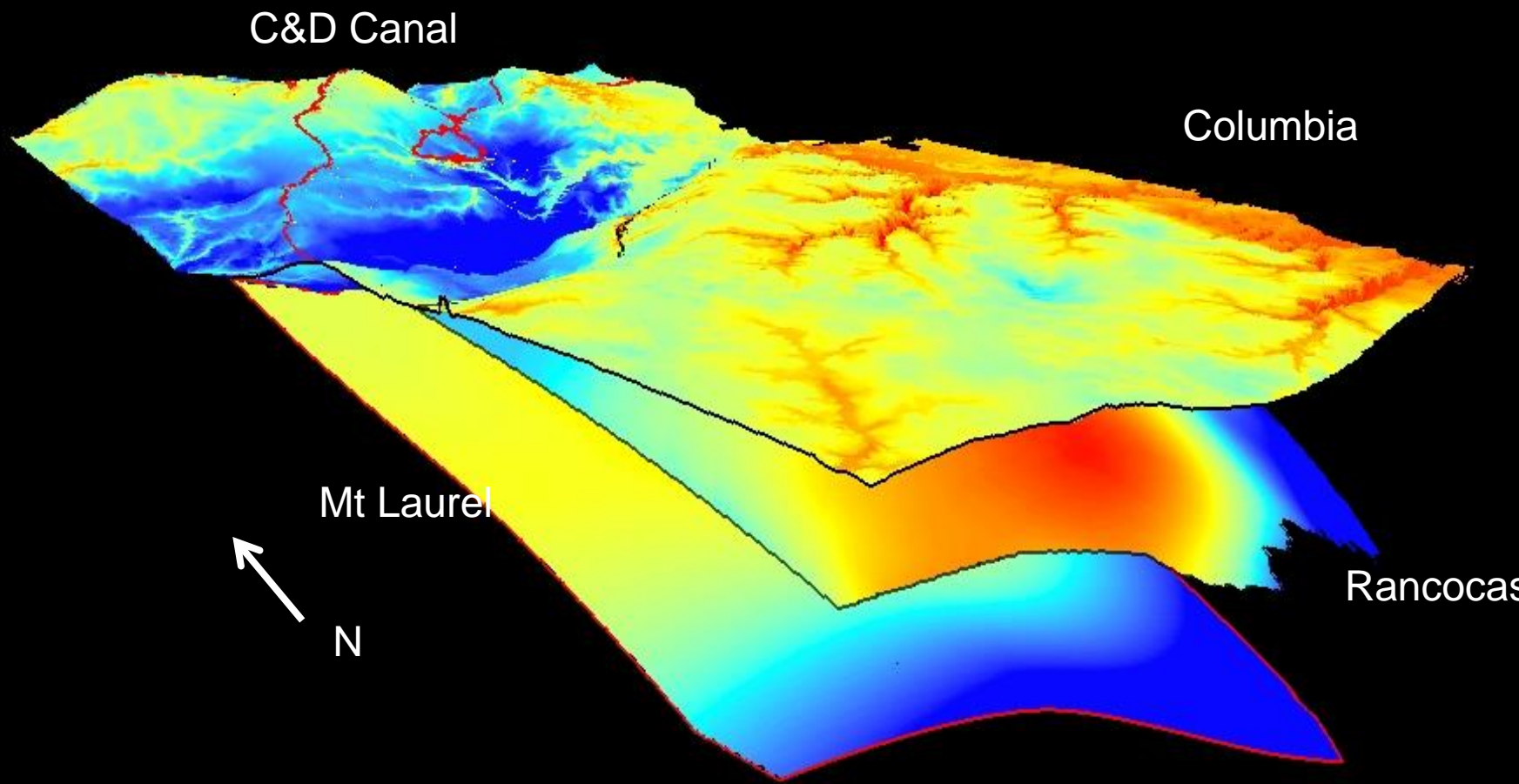
**David R. Wunsch
State Geologist and Director
Delaware Geological Survey**

**SOGW meeting
October 28, 2015**





- Northern Delaware underlain by crystalline rocks (Piedmont)
- Majority of Delaware underlain by Coastal Plain sediments
- Two Principal Aquifers represented:
 - Piedmont/Blue Ridge crystalline Rx
 - North Atlantic Coastal Plain
 - 13 major and local aquifers identified



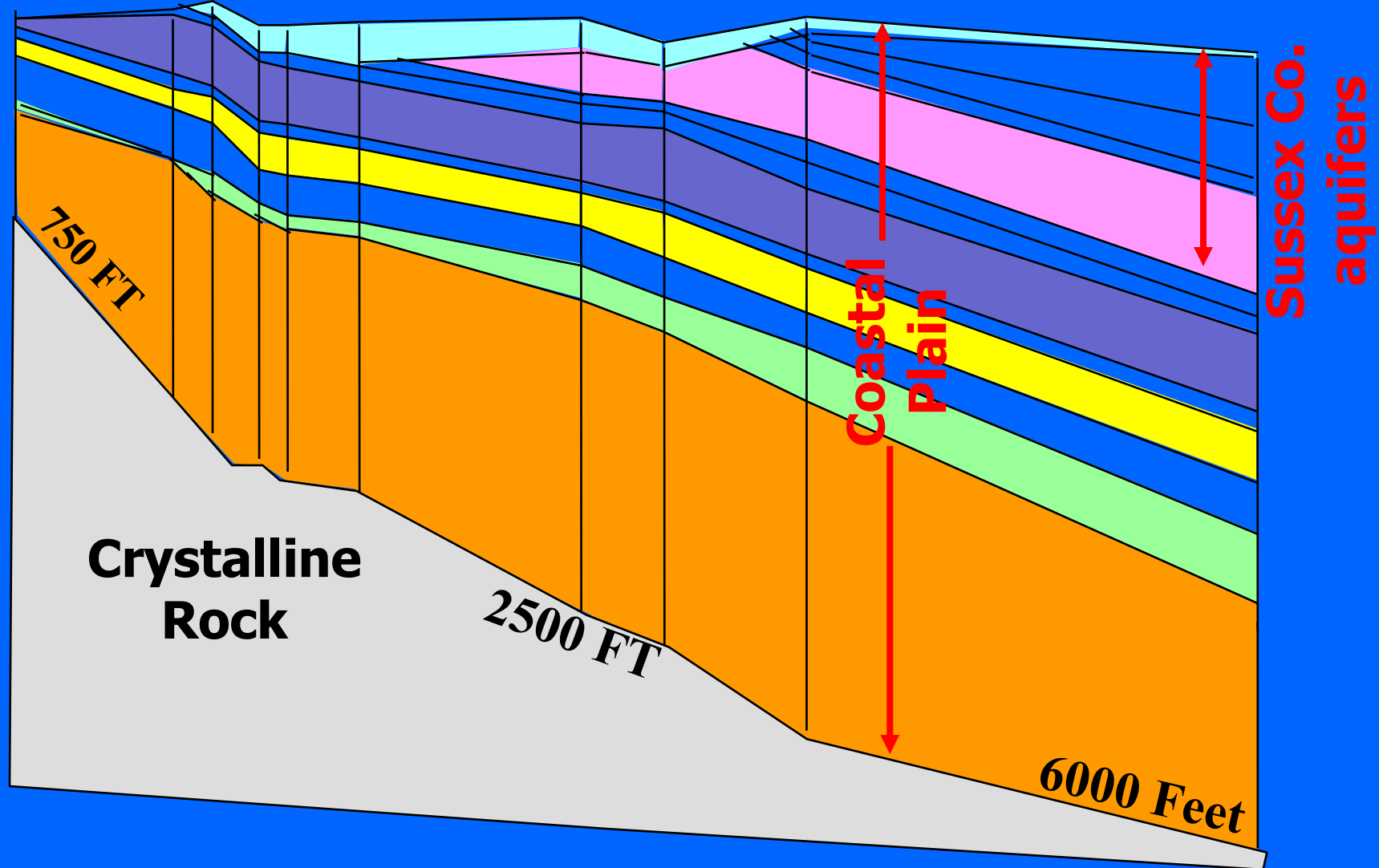
3-D mapping products

Simple Conceptual Model

C & D CANAL

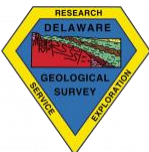
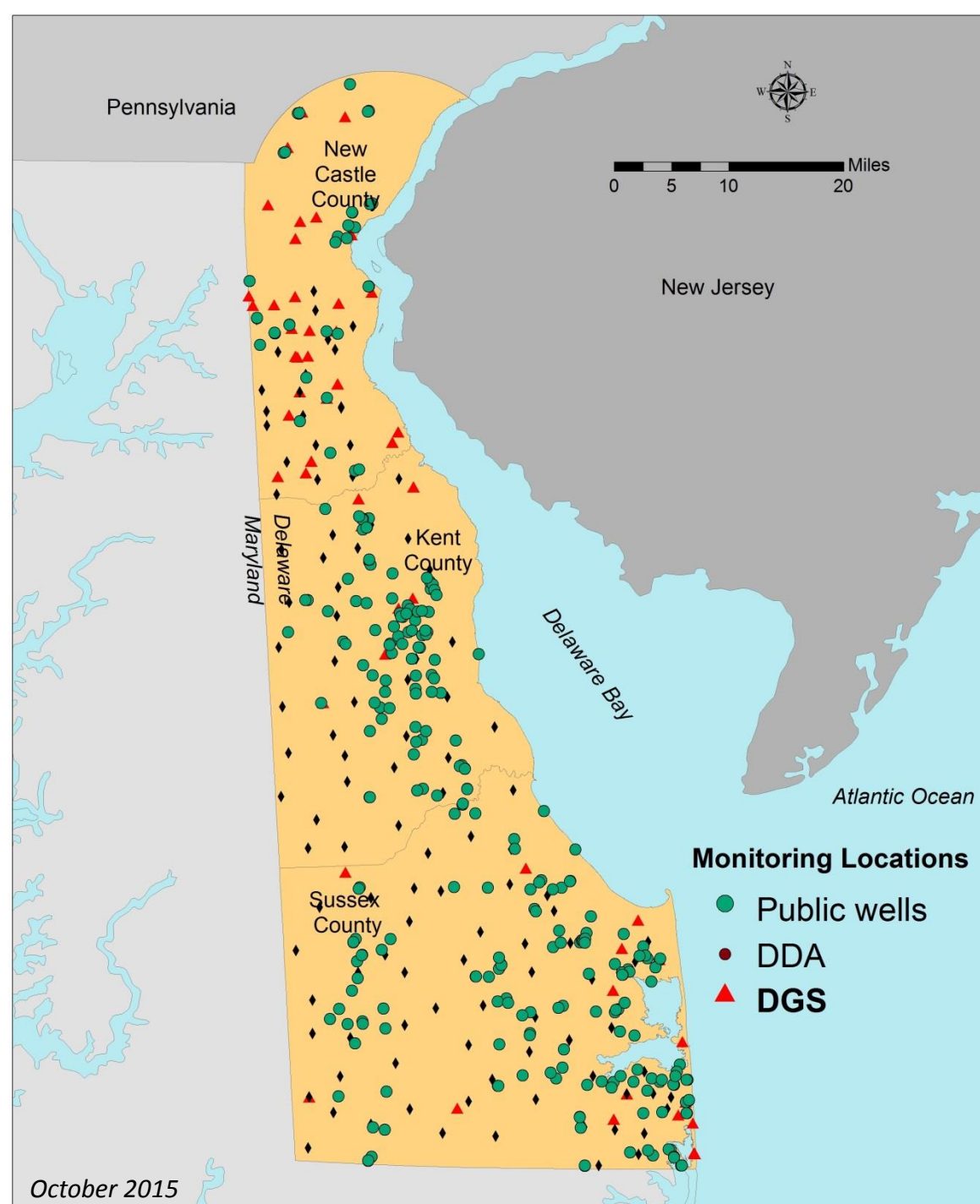
DOVER

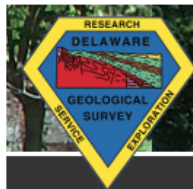
SELBYVILLE



Multi-Agency GW Monitoring Infrastructure in Delaware

- DGS – water levels, water quality (limited)
 - 123 wells
 - 20 DGS sites have nested wells
- DDA – Ag chemicals
 - 80 wells
 - shallow, surficial aquifer
- DNREC/DPH – water quality in public wells





The Delaware Geological Survey

Geologic and hydrologic research and exploration for Delaware

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Recent and Historical Groundwater Level Data

Data accessible on this page are a subset of DGS holdings. Click on the chart link to display a hydrograph or the data link to download all observations for the period of record.

For more details about this data, see [Well and Water Level Summary for Wells with 100+ Observations or 20+ Years of Data](#)

Table Heading Descriptions

- Alt - Values are in NGVD 1929 elevation of land surface in feet.
- Top, Bottom - Depth to top and bottom of open or screen interval in ft below land surface
- Obs - Number of water level measurements
- Start, End - Start and End dates for the period of record of observations

TABLE LIST • MAP

196 Items

DGS-ID▲	Data	Alt	Top	Bottom	Aquifer	Obs	Start	End
Bb34-34		259	145	298	cm	123	Mar 1977	May 2015
Bb34-40		252	45	60	cm	153	Mar 1979	May 2015
Bc43-01		339	8	164	ws	4050	Jan 1974	Apr 2015
Ca55-204		112	19	25	cl	2499	Nov 2006	Apr 2015
Cb12-10		177	103	410	cm	847	Jan 1978	May 2015
Db15-05		23	215	306	ptl	363	Mar 1979	May 2015
Db22-53		60	11	16	cl	107	May 1986	Apr 1996
Db24-10		78	21	24	cl	282	Aug 1957	Dec 1986
Db24-17		77	17	22	cl	84	Jun 1986	Aug 1993



Text Search:

☐ County

30 Kent County

59 New Castle County

107 Sussex County

☐ Aquifer

1 Chesapeake

3 Cheswold

3 Cockeysville

91 Columbia

3 Columbia-Pocomoke

2 Columbia-Ranocas

DGS Well ID Ca55-204

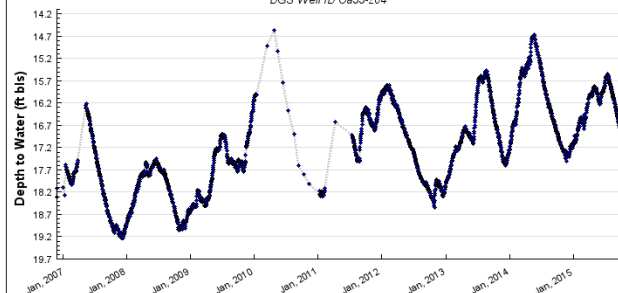
Location: New Castle County
Easting/Northing: 435650, 4391344
Latitude/Longitude: 39.669498, -75.750297
Altitude: 112 ft

Drilled Date: 2006-11-29
Start Date: 2006-11-29
End Date: 2015-04-17
Number of Obs: 2499

[Print](#) [Data Download](#)

Screen Top: 19 ft
Screen Bottom: 25 ft
Aquifer: Columbia

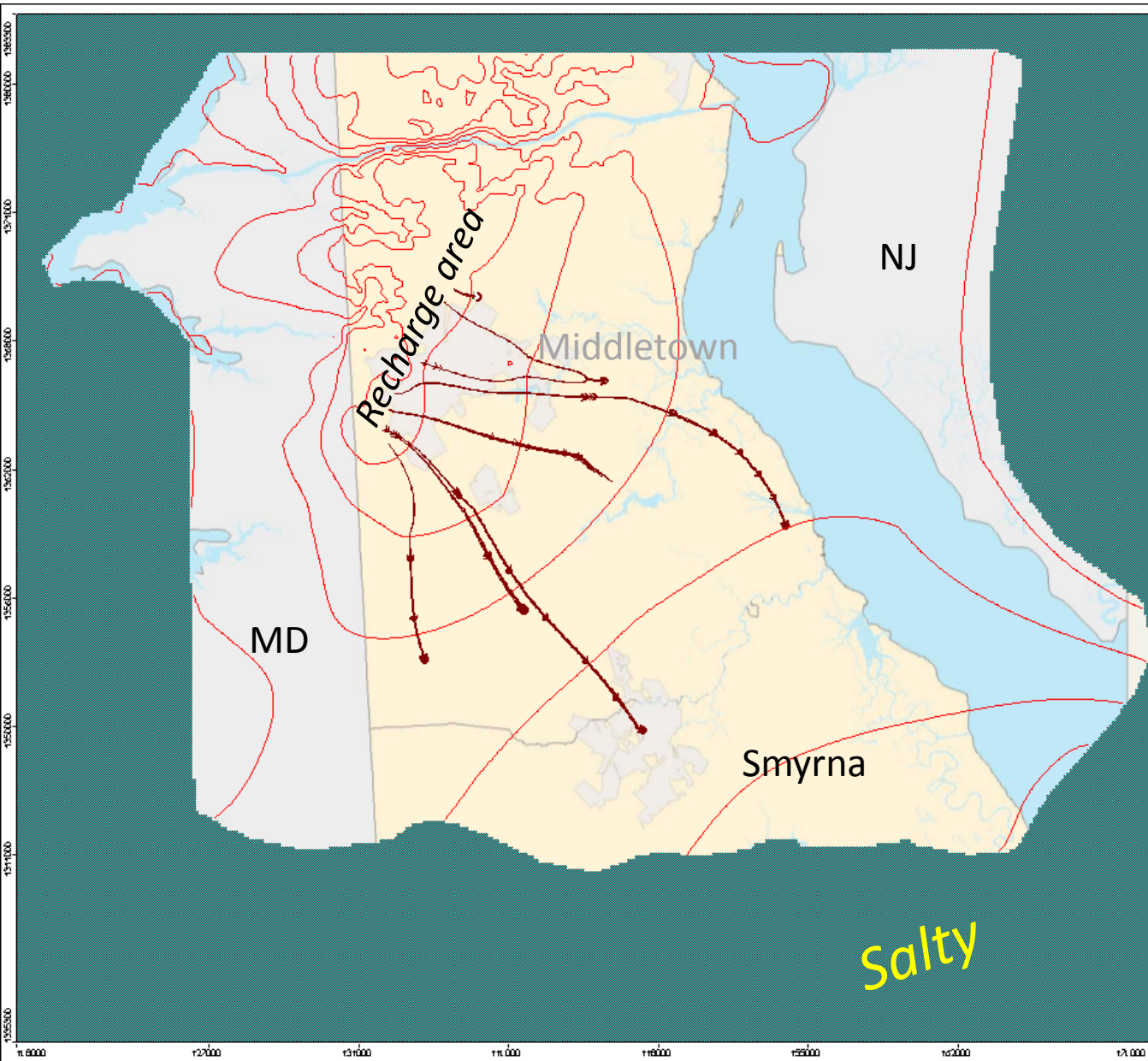
Delaware Geological Survey
DGS Well ID Ca55-204



Created on: October 26, 2015, 1:08 pm

Water levels for Ca55-204
Values are in feet below land surface (bls)
Page 4 of 196

Flow in Mt. Laurel Aquifer

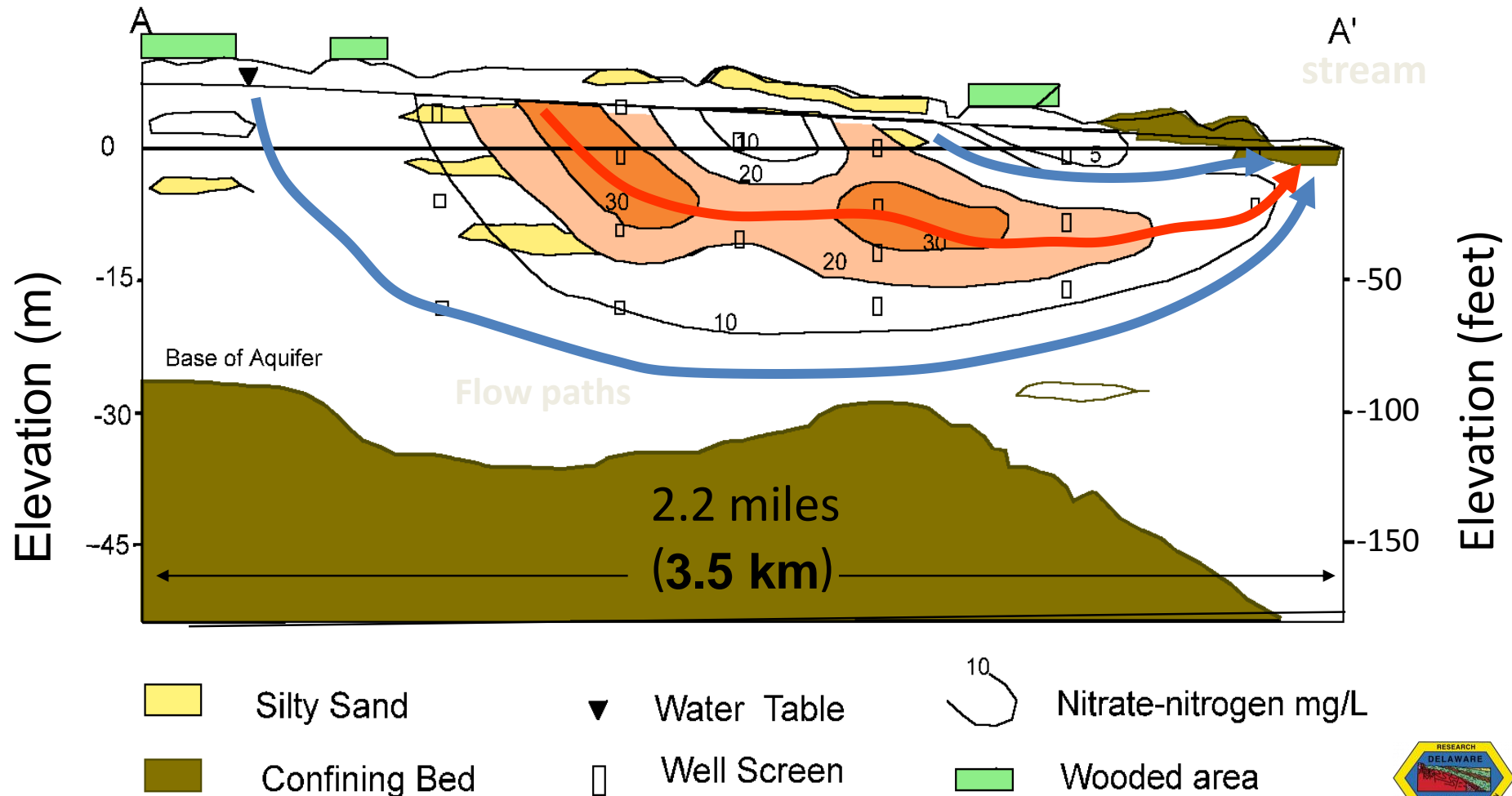


It takes hundreds to thousands of years for flow from recharge area to deep, confined aquifer.

Aquifer use limited to SE by salt and poor yield

Risk - Regional Transport of Contaminants

Decadal-scale problem



1. Water Resources

Aquifers and Groundwater Withdrawals, Kent and Sussex Counties

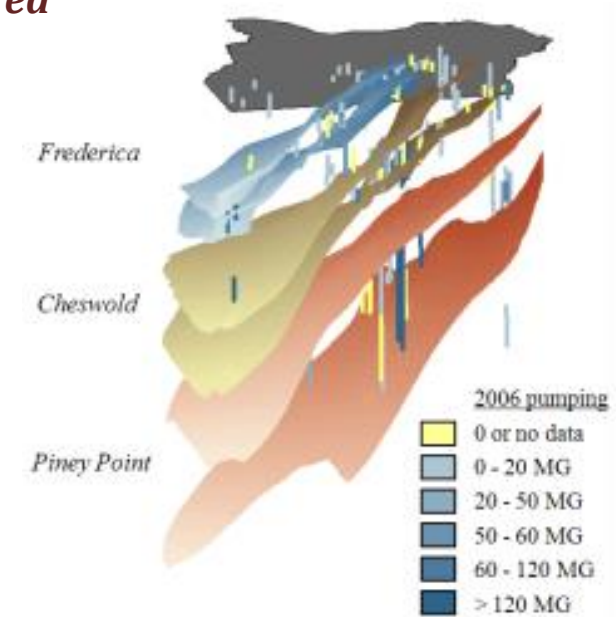
Project Contact: Peter P. McLaughlin, Jr.

Using new aquifer maps and a compilation of well data, groundwater withdrawals in Southern Delaware have been analyzed by aquifer and by area

- **Project complete: Data bases, map graphics, final contract report submitted to DNREC**
- **Last comprehensive analysis done over 35 years ago**
- **Ex: Water use for 160,000 reliant on a household wells were estimated to be 11.6 MGD (4.23 MGD Kent, 7.37 MGD Sussex)**

Value:

- ***Application to DNREC's water well and wastewater permitting, and water allocation programs***
- ***Provide updated knowledge on the distribution of aquifers in Kent and Sussex Counties***



Well screens of public wells mapped against aquifer depths in Kent County, rated by pumping

NGWMN Well Selection

- DGS Hydrogeology group (4 Hydrogeologists)
- Aquifer representation and classification based on DGS data, information (DGS, USGS studies and reports) , institutional knowledge, data records
- Guidance from *SOGW Framework Document*, fact sheets

Data Systems

- Water levels collected monthly
- WL Data loggers in 60 wells
- QA sensors (temp, specific conductance) in approximately 20 wells
- DGS Watsys
 - Oracle 11g, ArcGIS 10, Postgres 9, and several in-house developed applications to manage spatial and time-series data

Major task:

- Set up web services to allow connection and links to agency internal databases
- Define technical protocols and requirements of NGWMN harvesting methods

Questions?

